UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,206	06/19/2003	Darko Segota	11023.5	9031

21999 7590 04/28/2009

KIRTON AND MCCONKIE
60 EAST SOUTH TEMPLE,
SUITE 1800
SALT LAKE CITY, UT 84111

EXAMINER	
LEE, BENJAMIN P	
ART UNIT	PAPER NUMBER
3641	

MAIL DATE	DELIVERY MODE
04/28/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/600,206	SEGOTA ET AL.	
	Examiner	Art Unit	
	BENJAMIN P. LEE	3641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,12,13 and 15-24* is/are pending in the application.

4a) Of the above claim(s) *6 abd 20-24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5, 7-10, 12, 13 and 15-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/13/2009 has been entered.

2. Applicant has amended claims 1 and 18.

Response to Arguments

3. Applicant's arguments filed 4/13/2009 have been fully considered but they are not persuasive. Applicant argues that the Falco reference does not illustrate a blended segment structure to provide a smooth and gradual transition between variable height drop faces along the length of a given drop face. Applicant particularly argues that Falco does not teach a transition “between variable height drop faces”. In response, Examiner respectfully asserts that Applicant’s claimed subject matter is directed to “transitions between the variable heights along the length of a given drop face” and not "between variable height drop faces” as argued. Examiner respectfully asserts that Falco does in fact teach a “drop face” with variations in height along its length which

consist of transitions from a peak to a valley multiple times. Further, a portion of the drop face of Falco constitutes a “blended segment” as claimed in that each transition from peak to valley constitutes a "blended" transition from one peak to the next. Additionally, the illustrated transition from peak to peak on the length of the drop face of Falco constitutes a "smooth" and "gradual" transition.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-5, 7,8, 13, 15, 16, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wells et al. (U.S. Patent 5505409) in view of Falco et al. (U.S. Patent 5133519) and in further view of Fronek et al. (U.S. Patent 5848769).

5. In regards to claims 1 and 18, Wells et al disclose a fuselage comprising the following:

a. a frontal fuselage portion that leads through a fluid (col. 3, lines 55-59). Note that Wells et al disclose a "frontal portion of the fuselage" which inherently "leads through a fluid (air);

b. an outer fuselage surface relating with said frontal fuselage portion that receives fluid flow thereon (see Wells et al fig. 3 following);

c. at least one fluid flow regulator featured and operable with said outer fuselage surface and extending at least a partial distance around said fuselage (items 20 of Wells et al fig. 3 following and col. 4, lines 63-67);

d. fluid flow regulator comprising a leading surface and a trailing surface (see Wells et al fig. 3 following);

e. a pressure recovery drop extending a pre-determined distance between said leading and trailing edges/surfaces to form a down step, said pressure recovery drop comprising at least one drop face of a calculated distance (col. 3, lines 30-35), said fluid flow regulator functioning to regulate existing pressure gradients along said fuselage/surface subject to external flow of fluid to optimize and equalize said fluid flow and to reduce the separation potential of said fluid (see Wells et al fig. 3 and col. 3, lines 30-54);

f. a sub-atmospheric barrier generated at the base of said drop face as said

fluid encounters and flows over said pressure recovery drop, said sub-atmospheric barrier comprising a low pressure area of fluid molecules having decreased kinetic energy that serve as a cushion between said higher kinetic energy fluid molecules in said fluid and the molecules at said outer fuselage surface to facilitate laminar flow and assist in the reduction of the separation potential of said fluid (col. 3, lines 40-45). Note that the "step" disclosed by Wells et al creates a "low pressure area" and thus helps to reduce the separation potential of the fluid;

g. a trailing edge that defines and extends from the base of said pressure recovery drop that provides a trailing flow boundary for said fluid (see Wells et al fig. 3 following). Note that the "trailing surface" extends from the "pressure recovery drop" and inherently provides a trailing flow "boundary" for the fluid;

Wells et al fail to explicitly disclose that the pressure recovery drop is orthogonal. However, Falco et al disclose a drag reducing device incorporating orthogonal pressure recovery drops (see Falco et al fig. 1 following). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to incorporate orthogonal pressure recovery drops as disclosed by Falco et al, since orthogonal drops induce the greatest flow separation.

Further, Wells et al fail to teach that the height of a drop face varies along the length of a given drop face and that the drop face further comprises a length of a

blended segment structured to provide a smooth and gradual transition between the variable heights along the length of a given drop face. However, Falco et al teach a drop face that varies in height along its length and a “segment” of the drop face of Falco incorporates a “blended” transitioning between the variable heights along the length of the drop face (see Falco figures 7-9 following). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to incorporate a drop face which varies in height along its length as taught by Falco with the apparatus of Wells as modified to enhance mixing after the flow separation. Further, note that the variations in height from a peak to a valley along the drop face of Falco as illustrated in figures 7-9 constitute a "smooth and gradual" transition.

Wells et al as modified fail to disclose that the fluid flow regulator is capable of being repositioned in any direction about a surface. However, Fronek et al disclose a removable “fluid flow regulator” (drag reduction article) that is inherently capable of being repositioned in any direction on a surface (col. 1, lines 10-35 and col. 5, lines 52-62). It would have been obvious to one of ordinary skill in the art at the time of Applicant’s invention to make the fluid flow regulator “removable” as disclosed by Fronek et al, so that the fluid flow regulator can be replaced after damage.

Wells et al as modified also fail to disclose that the fluid flow regulator is removably attachable. However, Fronek et al disclose an “an article applied to surfaces to reduce the drag caused by fluids flowing across the surface” that is capable of being removeably attached to that surface (col. 1, lines 21-25) and positioned in “any” direction relative to airflow desired. It would have been obvious to one of ordinary skill

in the art at the time of applicant's invention to incorporate the ability to remove and reapply the modified Wells et al apparatus as taught by Fronek et al, so that the "fluid flow regulator" can be more easily subjected to routine maintenance or be replaced.

2. In regards to claim 2, Wells et al as modified disclose a pressure recovery drop is positioned at or proximate an optimal pressure recovery point defined as the location(s) about said surface at which there is an imbalanced or unequal pressure gradient forward and aft of said fluid, thus creating an adverse pressure about said fuselage, which adverse pressure gradient induces friction and pressure drag that ultimately increases the separation potential of said fluid (col. 28-35). Note that Wells et al disclose positioning the "steps" at a point where the nose meets the fuselage and/or along the length of the fuselage.

3. In regards to claim 3, Wells et al as modified disclose that the pressure recovery drop is oriented substantially perpendicular to the direction of flow of said fluid (see Wells et al fig. 3 following).

4. In regards to claim 4, Wells et al as modified disclose that the pressure recovery drop comprises a linear formation (see Wells et al fig. 3 following).

5. In regards to claim 5, Wells et al as modified disclose that the fluid flow regulator extends annularly around said fuselage (col. 4, lines 63-67).

6. In regards to claim 7, Wells et al as modified disclose that the pressure recovery drop extends about only a portion of said outer fuselage surface (col. 3, lines 55-59). Note that Wells et al disclose that the "steps" extend longitudinally along the "forward portion" (only a portion) of the fuselage.

7. In regards to claim 8, Wells et al as modified disclose that the outer fuselage surface features a plurality of fluid flow regulators that function together to regulate, influence, and control fluid flow and its properties and characteristics across said outer fuselage surface (see Wells et al fig. 3 following and col. 3, lines 39-45 and 55-59).

8. In regards to claim 13, Wells et al as modified disclose that the fluid flow regulator is integrally formed with said outer fuselage surface (see Wells et al fig. 3 following).

9. In regards to claim 15, Wells et al as modified disclose that the pressure recovery drop comprises a plurality of drop faces to magnify the influence of fluid flow regulator on said fluid (see Wells et al fig. 3 following).

10. In regards to claim 16, Wells et al as modified disclose that the fuselage comprises a fuselage of an aircraft (col. 1, lines 5-12).

11. In regards to claim 19, Wells et al as modified disclose that the moving body comprises the fuselage of an airplane or other similar aircraft (col. 3, lines 55-59).

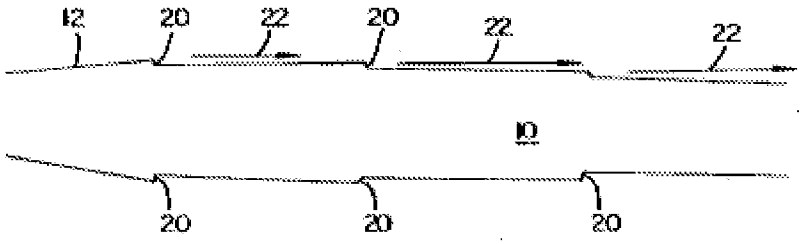

Fig. 3

Wells et al

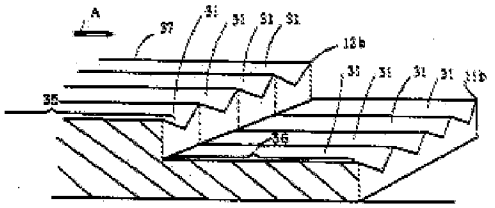

FIG. 7

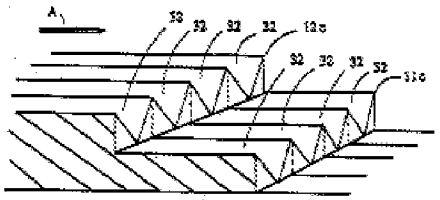

FIG. 8

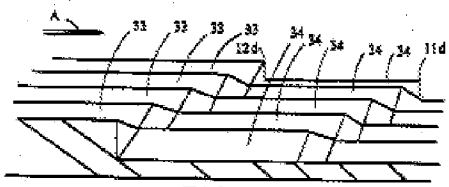

FIG. 9

Falco et al

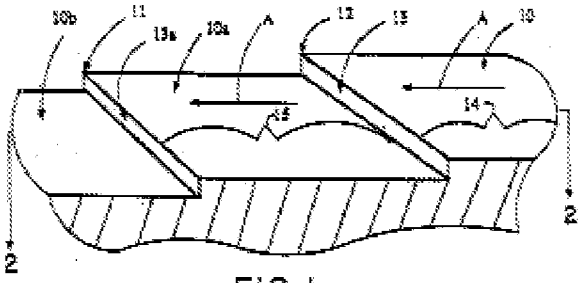

FIG. 1

Falco et al

12. Claims 9, 10, 12 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wells et al. (U.S. Patent 5505409) and Falco et al. (U.S. Patent

5133519) and Fronek et al. (U.S. Patent 5848769) as applied to claims 1 and 18 above, and further in view of Smith et al. (U.S. Patent 4890803).

13. In regards to claims 9, 10 and 12, Wells et al as modified fail to disclose that the fluid flow regulator is a dynamic fluid flow regulator capable of adjusting, on demand, with varying design constraints, flow characteristics, environmental conditions, and operational situations pertaining to said fluid, said object, and any combination of these. However, Smith et al disclose a "fluid flow regulator" (item 26 of Smith et al fig. 3 following) that is "movable" to manipulate flow characteristics (col. 3, lines 42-46 and 57-65) and is inherently capable of "adjustment" to meet any of Applicant's stated conditions or situations. Note that this is equivalent to Applicant's adjustable "pressure recovery drop". It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to incorporate a "movable" (adjustable) "fluid flow regulator" (pressure recovery drop) into/onto a fluid flow surface as disclosed by Smith et al, so that an operator can control the fluid flow dynamics and thus the lift generation of the fluid flow surface (body) is capable of manipulation according to the angle at which the fluid flow surface interfaces the direction of fluid flow (angle of attack). Note that based on the common definition of oscillate, "to move repeatedly from side to side or up and down between to points", presented by the Cambridge Dictionary of American English (www.dictionary.cambridge.org), the "movable pressure recovery drop" as stated by Applicant in claim 10, is inherently capable of "repeated [movement] between two points" and therefore Applicant's claim 12 is equivalent to claim 10.

14. In regards to claims 17, Wells et al as modified fail to explicitly disclose that the pressure recovery drop comprises an orthogonal design. However, Smith et al disclose a "drop" that is at a right angle to the fluid flow surface (see Smith et al fig. 3 following). It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to require that the "drop" is at a right angle to the flow surface as disclosed by Smith et al to achieve the most significant pressure drop.

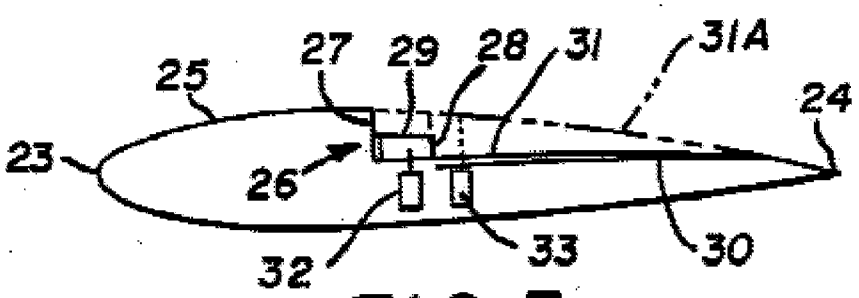

FIG. 3

Smith et al

Summary/Conclusion

15. Claims 1-5, 7-10, 12, 13 and 15-19 are rejected. Claims 11, 14 and 25-37 are canceled and claims 6 and 20-24 are drawn to a non-elected invention as per response to Restriction/Election dated 12/13/2006.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin P. Lee whose telephone number is 571-272-8968. The examiner can normally be reached between the hours of 8:30am and 5:00pm on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on 571-272-6873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Benjamin P. Lee/

Examiner, Art Unit 3641